10.1

To decimal

a) $1110101\ 0110_2$

$1 \cdot 2^6 + 1 \cdot 2^5 + 1 \cdot 2^4 + 0 \cdot 2^3 + 1 \cdot 2^2 + 0 \cdot 2^1 + 1 \cdot 2^0$

117.

$0 \cdot 2^{-1} + 1 \cdot 2^{-2} + 1 \cdot 2^{-3} + 0 \cdot 4^{-4}$

0.375

117.375_{10} ✓

b) 11.01010101_2

$1 \cdot 2^1 + 1 \cdot 2^0$

3

$0 \cdot 2^{-1} + 1 \cdot 2^{-2} + 0 \cdot 2^{-3} + 1 \cdot 2^{-4} + 0 \cdot 2^{-5} + 1 \cdot 2^{-6} + 0 \cdot 2^{-7} + 1 \cdot 2^{-8}$

0.332031

3.332031_{10} ✓

c) $2A_H$ $A = 10$

$2 \cdot (16^1) + 10(16^0)$

$32 + 10$

42

42

Convert to hexadecimal

a.) 1023_{10}

$1023/16 = 63$ r $15 = F$
$63/16 = 3$ r $15 = F$
$3/16 = 0$ r 3

$3FF_{16}$

b.) $10\ 111010\ 1101$

$1 \cdot 2^{11} + 0 \cdot 2^{10} + 1 \cdot 2^9 + 1 \cdot 2^8 + 1 \cdot 2^7 + 0 \cdot 2^6 + 1 \cdot 2^5 + 0 \cdot 2^4 + 1 \cdot 2^3 + 1 \cdot 2^2 + 0 \cdot 2^1 + 1 \cdot 0^1$

2989

$2989/16 = 186$ r $13 = D$
$186/16 = 11$ r $10 = A$
$11/16 = 0$ r $11 = B$

BAD_{16}

C.) 61453_{10}

$61453/16 = 3840 \quad r\ 13 = D$

$3840/16 = 240 \quad r\ 0$

$240/16 = 15 \quad r\ 0$

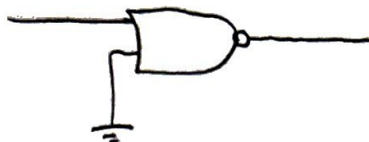$15/16 = 0 \quad r\ 15 = F$

$FOOD_{16}$ ✓

10.7

A)

This is a nor gate, the output will be high
if the input is high, it usually depends on the
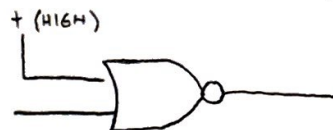inputs but there is only one here. This will
also invert.

B.)

This is an and gate, the output will be high
if both inputs are high, there is only one input
for this gate.

C.)

This is a nor gate, the output will be high if
one of the inputs is high, since one is tied to
ground, the other input just has to be high. This
will also invert. No high input, therefore no high output.
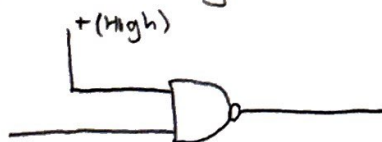
D.)

+ (HIGH)

This is a nor gate, since there is a high input, the output
of this will be high. The signal in this nor gate
will also invert.

E)

This is an and gate, if both the inputs are high, the output
will be high. But since that is not the case here, the output
will not be high.

+(High)

f.)

This is an and gate, if both the inputs are high, the output
will be high and it will invert. Since only one input is high, the
output will not be high and it will not invert.

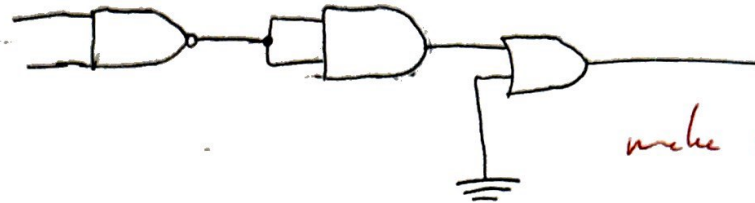make truth
tables!!

Taylor Larrachea
Dr. Hosterman
Phys 231 HW

10.8

a) Inverter From a NOR   1 input!

A —[>o—

b) OR From NOR's

✓

=D - =D—

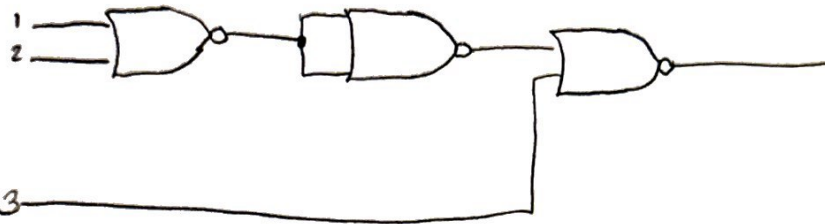c) OR from NANDS

make truth tables!

10 a

a) 3 input $\xrightarrow{\text{From}}$ 2 input
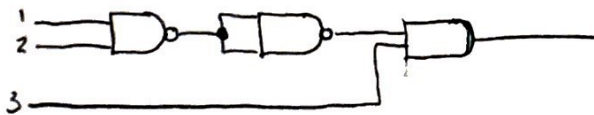
 ✓

b) 3 input $\xrightarrow{\text{From}}$ 2 input

 ✓

truth tables!!

c) 3 input $\xrightarrow{\text{From}}$ 2 input

d.) 3 input $\xrightarrow{\text{From}}$ 2 input